

Follies, Foibles and Justice of U.S. Environmental Protection

Presented to the Tucson Conservative Forum, March 25, 2017 @ Hungry Fox Restaurant, Tucson, Arizona
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"FolliesFoiblesAndJusticeOfU.s.EnvironmentalProtection", at archive.org

God-given " unalienable rights to life, liberty and pursuit of happiness" <i>include</i> environmental protection, clean and safe ambient air, soil, water and indoor air, and sound management... Everyone wants to live, work and recreate in an environmentally safe world. One would think this a universal, <i>natural right</i> , a gift if you like. Torah, Bible, Koran and many commentaries support this view.	Environmental protection - natural rights
An Irish Roman Catholic priest, new to his Native American parishioners, was murdered in 1964 after paving the open sand and gravel parking lot around the church. Why?	Awareness
April 20, 1969 was the first Earth Day. EPA was established on Dec. 2, 1970 by R-President Richard Nixon.	First Earth Day
Command-and-control vs. make the polluter pay. "It's just common sense. But the problem is that common sense is not very common!" See Schmidheiny, 1992. <i>Changing Course: A Global Business Perspective on Development and the Environment</i> .	Dr. Chickoo Batra
70's, 80's, 90's: CWA, NEPA/CEQA, RCRA, CERCLA, AHERA , water/ wastewater/ waste for USEPA, USN, USACE, USAF, municipal & private clients. 2000's: >\$60B NEPA -equivalent (22CFR216, 1976) for ADB, USACE, WB, USAID foreign assistance plus water/ wastewater/ waste/ sanitation/ climate adaptation. See Hawken, 2010. <i>Ecology of Commerce Revised Edition: A Declaration of Sustainability</i> .	Later years

It's very difficult to perform credible, reproducible and acceptable risk assessments without being <i>too safe (conservative)</i> or <i>too risky (liberal)</i> . UC Berkeley conducted early 80's cancer-risk assessments from breathing urban air and drinking surface and groundwater. They found by their models: an additional 3 cancers/ million attributable, with 2.7% from breathing, nearly 0.3% from drinking surface water from THMs, and a smidge from drinking groundwater from VOCs. Dr. Bruce Ames at Berkeley ran many petri-dish tests with VOCs and skins of various fruits and vegetables; he demonstrated that fruits and vegetables produced <i>higher cancer rates</i> than VOCs! Most human risk assessments are based on extrapolating long, multi-blind tests and autopsies on mice and rats, with <i>conservative</i> assumptions; chemical structure similitude is used to evaluate the carcinogenicity of other chemicals. Much uncertainty. See Derelanko & Auletta, eds., 2014. <i>Handbook of Toxicology</i> , 3 rd ed.	Perils of environmental risk assessments
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Air: particulates and fumes: field ag, mining, burning oil & gas, fuels, forests, wood; 'bad' indoor air.

Surface water: untreated sewage, oil leaks/ spills, ag chemicals.

GW: LUST petroleum wastes; abandoned & active manufacturing, military & landfills & cemeteries– metals, pesticides, PCBs, VOCs.

TBD: Pharmaceuticals, personal care products, endocrine disrupting compounds as contaminants of evolving of concern.



Most U.S. pollutants

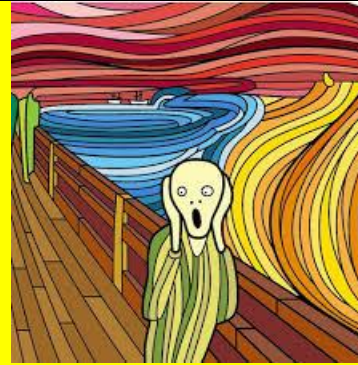
Decades ago, we all saw “pollution” from **smoke stack industries**, automobile and power plant emissions, fish kills from industrial and municipal wastes, heaps of floating garbage, overfilling landfills, acid-rain killing agriculture and forest industries. It was highly visible. Congress responded to public outrage from LA and NYC smog deaths in the 60's, but since we've slow-acting pesticide poisoning/ deaths of farmworkers, had “underground smokestacks” from VOCs from “clean computer and electronics” industries leaking into underground drinking water sources. Love Canal, Stringfellow, Bhopal, EXXON Valdez, BP Oil Spill toxic releases. These were invisible contaminants, thalidomide and PCBs, VOCs and Agent Orange/ Dioxin birth defects, cancer-causing at then barely detectible analytical laboratory levels. Advances in monitoring and evaluation, and risk assessment technologies add CECs.

Urban Heat Islands, the new asphalt jungle. Observed by British geographer with a thermometer in London. Urban areas significantly warmer by several degrees than surrounding rural areas due to human activities, especially black asphaltic surfaces. Impacting human health. Remediate by lightening exposed surfaces, narrowing streets, adding shades trees and ramadas, and reducing GHG emissions. Austin, Chicago, DC, Honolulu, Salt Lake City, Sacramento, Takoma Park leads. President GW Bush issued 1st UHI Executive Order to **lighten federal roofs**.

Climate Change. Several decades-old observations of global increases in ambient air temperatures, rising sea levels, sea advancing into coastal land and groundwater, increased coastal erosion, receding coastal ice sheets and mountain glaciers, mass migration/ infestation of alien insect and plants, modified coral and aquatic habitats and ocean currents, early and late growing seasons, increased frequency of extreme climate/ weather events, climate immigrants, etc. Fair to good global **factor analysis** and **correlations** and predictive modeling fair on global level with continue fine-tuning. Now the science of **extreme-event attribution** is new way to see what climate causes have on specific outcomes. Uses multi-variable changes over non-changed or ambient pre-existing conditions which can attribute direct, narrow time and space causes and effects. Credibility appears to be **beyond a reasonable doubt** but yet to be litigated per Climate Central; www.climatecentral.org. Likely greenhouse gas **caps**, **taxes** and **exchanges** are coming as in California, Colorado, Maryland, Washington, Canada, and several African, Asian, Oceania, European, Central American countries as move from **command and control** to **make the polluter pay**; en.wikipedia.org/wiki/Carbon_tax

See NASA, NOAA, USACE, USAID, USDA, USEPA, USGS, Climate Central and ICLEI for latest issues.

Poor people with little or no awareness of rights or access to ESQs – *uninformed* do-it-yourselfers; miners/ smelters; field ag workers; residents in hot-spots of petroleum & chemical plants, mines, smelters, refineries, pipelines, rails, landfills, unsecured RCRA & SUPERFUND sites & military facilities; Lower Mississippi River/LA; SE Texas industrial; NJ coast industrial. Some like CWA, RCRA, CERCLA exempted, excluded, waived compliance for special groups like military, Congress, mining, power plants, national security. 22CFR216 has categoricals. CERCLA is retroactive, joint & several liabilities, triple cost recovery, no statute of limitations, abandoned hazsub sites.



Who suffer most by pollution?

Consequences

Americans **pay more** for environmental initiatives, propositions and protection through **taxes** and user **fees**. Improving garbage/ waste/ recycling servicers, as well as upgrading water and energy systems increases **costs**. Conserving water and electricity leads to higher water, sewer and electricity **fees** to cover capital **costs** and **debt**. Adding new or alternative sources to grids increases distribution/ transmission **costs**, water and electricity **fees**.

Decisions for new water and energy sources are public **policies** and public and sometimes private **investments**. Americans benefit through **opportunities** in process participation, health, safety and sustainable development. Utilities provide low-income subsidies for which high-income customers pay for **social justice** and **equity**. See myaccount.swgas.com/content/lira, tep.com/customer-assistance, tucsonaz.gov/es/low-income-assistance-program, tucsonaz.gov/water/low-income-assistance-program, webcms.pima.gov/cms/one.aspx?portalId=169&pageId=195661, needhelppayingbills.com, pima_county_assistance_program

EPA's first Administrator William Ruckelshaus, lamented that in his first term under R-President Nixon, industry was lobbying against environmental regulations, but in his second term under President Reagan, industry lobbied for regulatory clarity and stability (NPR interview, Mar. 12, 2017; https://www.nytimes.com/2017/03/07/opinion/a-lesson-trump-and-the-epa-should-heed.html?_r=0).

Environmental regulatory uncertainty is bad for business!

IS THE FEDERAL GOVERNMENT THE ANSWER? "Environmental federalism"

Several U.S. presidents had their own “sacred cows” to promote and fund, under which sincere persons rallied to “improve the world” and make it a Utopian Paradise on earth. For example, FDR’s social nets, Eisenhower’s think tanks, JFK’s youth candidate, space race and foreign assistance to promote American democracy, Johnson’s War on Poverty (which I believe we lost but won the War in Vietnam) and improved U.S. water management through funding land-grant colleges’ WRRCs, Nixon’s War on Drugs (which we lost) and on cancer (which we’re winning) and establishment of the EPA and the **CWA** to regulate water and wastewater, Carter’s FERC/energy and education agency initiatives and the cradle-to-grave **RCRA** to regulate **solid** and hazardous waste, GH Bush’s acid-rain, acids cap & trade & wetlands conservation, Bill Clinton’s/ Al Gore’s Brownfields initiatives to restore hazwaste sites to productive areas like Emeryville and Climate Change initiatives, and more recently Barack Obama’s black lives, “Waters of the U.S.” rule under **CWA**, climate change initiatives (and economy) to combat what he and U.S. Representative (D-AZ) Raul Grijalva and former R-U.S. Secretary of State John Kerry believe is otherwise the greatest threat to human kind after conservatives. More often than not, Republicans like Gerald Ford, Ronald Reagan (pushed federal regulations to the States and withdrew funding), and GW Bush, and likely Donald Trump abhorred federal roles and funding in these and related areas, even to the high point of Reagan appointed EPA **Superfund** Administrator from the chemical industry refused to implement federal law and in fact served prison time! Does anyone remember **Rita Lavelle**? Or Regan’s EPA Administrator **Ann Gorsuch Burford**, the mother of President Trump’s first proposed Supreme Court Justice. Hands up.

Many Americans believe the federal government is the answer to many of our social, economic and together challenges, while so many believe state governments are the answer, and so few believe there is no answer.

U.S. FOREIGN ASSISTANCE, ~ \$25B direct & ~\$25B indirect, annually

Some **USAID international development successes and failures**, contrary to former U.S. Representative (R-AZ) Matt Salmon

Project	Budget, period	Results
Indonesia violence against women	\$2M, 3 yrs	Failed; public learned NGO was USG-funded; mutilation/ murder
Iraq energy, water, wastewater infrastructure	\$1.2B, 5 yrs	Failed; Bechtel withdrew; 60 staff killed
Afghanistan education infrastructure	\$769M, 5 yrs	Failed; ghost schools, 55,000 schools destroyed, teachers killed
Jordan public water, energy & waste plan	\$7M, 5 yrs	Succeeded social marketing
Pakistan higher ed/ water-ag-energy COEs	\$6M, 3 yrs	Succeeded as Fulbright fellowships
Yemen community livelihoods	\$124M, 5 yrs	Failed; 2011 Arab Spring
Africa water supply systems	\$241M, 3 yrs	Failed; no customers

Development Experience Clearinghouse, *dec.usaid.gov*. USAID mid-term evaluations and post-project assessments. Office of the Inspector General post-project audits. Judge John J. Sirica, of previous Watergate fame, law suit ruling of unlawful Malathion organophosphate insecticide deaths in Pakistan malaria fight in 1975.

FEDERAL

Partial List of U.S. Federal Environmental Statutes – mostly **command-and-control prescriptive**, few **informational** for decision-makers (NEPA, NHPA). They: (1) were passed by the U. S. Congress, and (2) pertain to (a) regulation of the interaction of humans and the natural environment, or (b) conservation and/or management of natural or historic resources. They need not be codified in the U.S. Code of Federal Regulations. There are others, plus amendments, updates, revisions, administrative rules, legal decisions and common compliance practices. Most States and Tribes adopted federal laws and have primacy to implement them with various success levels. Some States are more stringent than federal law, such as the **CEQA** (preceded highly litigious **NEPA**). The government itself passed a law for its work abroad (22CFR216) for environmental protection as a result of a law suit over several **wrongful deaths from pesticide accident**. Reg. 216 is not enforced in practice as there is little or no public interest in litigating it and the USAID Automated Directive System has NO mandated penalties for non-compliance.

Administrative Procedures, 1946	Federal Land Policy and Management, 1976	National Park Service Organic, 1916
Antiquities, 1906	Federal Insecticide, Fungicide & Rodenticide, 1947	Noise Control, 1965
American Indian Religious Freedom, 1978 (UN Declaration on Rights of Indigenous Peoples, 2007)	Federal Power, 1920	Nuclear Waste Policy, 1982
Asbestos Hazard Emergency Response, 1986 – unions	Fish and Wildlife Coordination, 1934	Ocean Dumping, 1988
Atomic Energy, 1954	Fisheries Conservation & Management, 1976	Oil Pollution, 1990
Bald and Gold Eagle Protection, 1940	Food Quality Protection, 1996	Resource Conservation & Recovery (1976)/ HSWA, 1984/ FFCA, 1992/ LDPFA, 1996 – reduce solid waste
Clean Air, 1963	Forest & Rangeland Renewable Policy, 1974	Rivers and Harbors, 1882
Clean Water, 1972	Lacey (wildlife, fish, and plants), 1900	Safe Drinking Water, 1974
Coastal Zone Management, 1972	Marine Mammal Protection, 1972	Surface Mining Control & Reclamation, 1977
Comprehensive Environmental Response, Compensation & Liability (“Superfund,” 1980)/ SARA, 1986 – Love Canal abandoned hazwaste	Migratory Bird Treaty, 1918	Toxic Substances Control, 1976
Emergency Planning & Community Right-to-Know, 1986	Mineral Leasing, 1920	Water for the Poor/ Paul Simon, 2005
Endangered Species, 1973	National Environmental Policy, 1970 – informed-decision	Wild & Scenic Rivers, 1968

Energy Policy, 2005	National Forest Management, 1976	Wilderness, 1964 (National Wilderness Preservation System)
Federal Food, Drug, and Cosmetic, 1938	National Historic Preservation, 1966 – informed-decision	[22CFR216, 1976] Foreign Assistance's NEPA
See Bell, Brownell, et al., 2013. <i>Environmental Law Handbook</i> , 22 nd ed.; Leonard & Robinson, eds., 2009. <i>Managing Hazardous Materials: A Definitive Text (Revised)</i> ; Bass & Skinner, 2001. <i>The NEPA Book: A Step-By-Step Guide on How to Comply with NEPA</i> , 2 nd ed.		

Administrative Procedures Act establishes the process by which federal agencies make regulations and the process by which citizens can challenge those decisions. Rarely, Congress passes a law with hammer provisions as in **RCRA**. EPA is the presumptive national environmental authority. Every modern president has a **Federal Environmental Executive**. I knew the one who wrote R-President GW Bush's policy to lighten government building rooftops to help mitigate **Urban Heat Islands**.

Who administers federal laws? Primarily **USEPA** directly or through primacy granted to States, plus President's **Council on Environmental Quality** for **NEPA**, **USACE** for inland waters, **NOAA** for coastal waters, **USDA** (Forest Service) for national forests, **National Park Service, Forest Service, Fish and Wildlife Service**, and/or the **Bureau of Land Management** for national monuments, **Bureau of Indian Affairs** for Indian Lands, **NRC** for radioactive wastes, **MOUs** (ex. mixed low-level rad and hazwaste; military facilities), and legal venues for relief through administrative and other courts IF plaintiffs have "standing." Standing is a big issue, including for Indians who possess **diminished sovereignty** as **federal dependents** per Tatum & Shaw, 2016. Law, Culture & Environment.

RCRA Class I Landfills for hazardous waste are required to have a three-foot thick clay liner beneath the landfill to protect underlying groundwater from landfill leachate. The **RCRA** writers assumed that a foot of compacted clay would be impermeable to water and certainly three feet would be even better. However, a Rice University professor and colleague of mine discovered by laboratory and field tests that several carcinogenic VOCs like TCE would readily flow through any thickness of clay liners. The EPA then required "leachate collection" systems to be installed in the liners after much debate and with debatable results. BTW, who's buried at Rice University? Hint: Who's buried at Stanford? Second hint: Who's buried at Grant's Tomb?

The **CWA** sets standards for effluent releases from **POTWs**. Initially, upgrades for the standards were paid by the federal government which was boom to consultants and engineers for several years until that ended when municipalities would be required to pay for these federally mandated, and often state enforced requirements.

One could get around the EPA book-standards if triplicate and reproducible lethal dose laboratory tests (LD₅₀) on specified laboratory-bred fish using effluent provided by the **POTW** are within acceptable limits. This created a great laboratory business for decades, yet many tests were inconclusive and some even showed that drinking water killed more fish than polluted water! I suspect because the "drinking water" used in those tests contained chlorine as a residual disinfectant.

Sometimes science conflicts with regulation. Regulations need to be clear, simple, and enforceable. But pollution can be very complex.

For example, most of you if ground-up with your clothes on would show some high levels of poisonous metals in your grinds. Say from metal coins, belt buckles, jewelry, watches, zippers, piercings, tattoos, etc.

To enforce water quality standards for wastewater effluent, and more recently for non-point pollution sources from say parking lots and streets, the standards are typically a single number for each chemical. But chemicals often have several forms.

So dissolved arsenic, iron, chromium, etc. have several charges or valences where some are deadly and others are required human health nutrients. In addition, there's a vast difference if the metal contaminant is a solid mass or in a dissolved solution which can enter your blood stream. All the iron, chromium, copper, nickel, etc. in your coins, watches, jewelry and piercings if you have them, can't readily get into your blood stream, so it's patently silly to count these in the laboratory analysis to meet the regulated standard.

Most dissolved metals are highly attracted to clay particles of any and all sizes. Plus many metals are within the physically embedded within soil or sediment mineral matrix, which are unavailable to life forms. The colorful chrome, nickel, cadmium, lithium, etc. in silica which make it amethyst, emerald, garnet, sapphire, lapis, turquoise, etc. are not dissolved in your blood stream so they shouldn't count.

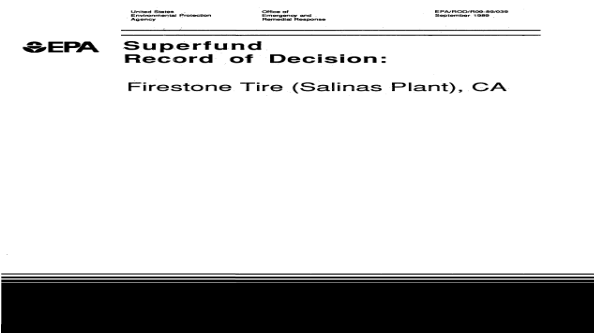
Finally, due to medical and pharmaceutical research and drug production, there's an enormous amount of anthropogenic or man-made, benign **chelating agents** which tie up metals making them biologically unavailable in the southern San Francisco Bay waters.

It's a nightmare to convince regulators to exclude metals in such forms, species or states for a one-book number regulation standard. Consequently, treating wastewater to meet these standards is extremely "conservative" or "overly protective" an enormously costly.

Early 19th c. shipyard, Westinghouse-USN/SF, 500+ ac coastal land & 100+ ac offshore, contaminated soil & water – heavy metals, radium, pesticides, PBCs, VOCs.
Should NOT have been **SUPERFUND** per MITRE Corp.
Inadvertently found hazwaste sandblast grit metals & pesticides in "clean Parcel A."
Contaminated groundwater flowed UPHILL towards "Pump Sta. A" to **POTW**.
Contractor mixed contaminated with clean soil for hauling.
Innovated landfill cap saved USN tens of millions \$.
USN policy to test/address MTBE cost USN tens of millions \$.
Synoptic GW measurement event exposed failed tidal gages; resolved by SC tidal simulation.
Ambient metals from Serpentinite-derived artificial fill.

Hunters Point Shipyard **SUPERFUND** site in poorest



D-Mayor Willie Brown would not accept cleanups.	
GW monitoring wells for heavy metals from manufacturing Caretaker family's DRINKING WATER SOURCE Froze contaminated GW to temporarily end offside migration	Superfund Site: SIKES DISPOSAL PITS, CROSBY, TX
STATES	
Monitored Natural Attenuation. Mystery writer, UNM Professor Tony Hillerman inspired.	MONA for oil spill at Vandenberg AFB, CA protects Native American ancestral remains
Raw untreated wastewater from military base: major contaminant.	Edwards Sole-Source Aquifer, Bexar Co., TX
Tried to merge the several CA environmental agencies to save money: Health, Toxic Substances Control, Air Resources, Waste Management, Water Quality Control, Pesticide Regulation, Natural Resources, Environmental Health Hazard Assessment, Conservation. Prison print shop print RCRA hazwaste cradle-to-grave manifests. Recalled in energy rolling brown-out crisis. Replaced by Governor.	 R-CA Governor Pete Wilson's follie
George Markette NOT Cal Journalist Herb Caen... TCE was used to clean up a former tire manufacturing plant before sale @ 53-ac Salinas site on 256 ac, contaminated shallow GW for several miles in all directions. Fishing trip to improve morale – secretary gets big fish. Field lab was way expensive due to GCMS purges & traps. Built GW plume collection system, TCE-removal plant & buried plant outfall pipeline to Salinas River (on Salvatori Panattoni's commercial walnut orchard). Pipeline didn't discharge to the River? Flanges not connected or tested. Marty Bozeman was transferred to Anchorage.	

Activist Jane Fonda & CA-D CA Representative Tom Hayden initiative: CA Proposition 65.

Overwhelming public support. CA governor to post & revise list of hazchems @ workplace. [Sued governor to comply – yes, Pete Wilson]. Allowed 3rd parties to sue State for non-enforcements /w bounty provision. Workers and public demand non-toxics – shoe polish, white out, printer inks... Mostly ESQ-rich Surfrider sues State over toxics in Humboldt Bay from International Paper bleaching plant, VERY BIG AWARD (triple damages), IP pays; revising paper bleaching.

Safe Drinking Water & Toxic Enforcement Act '86



Informed-decision act **National Environmental Policy Act** requires: when the federal government has authority to grant or deny a permit for a proposed activity, or federal land and waters are involved, the government must review the proposal and reach a FONSI, may order an EA, or a more comprehensive EIS with stakeholder, beneficiary and public consultants. Finally, a ROD is issued. Often **NEPA's** EIS process is used as a delaying tactic to give project objectors time to prepare a litigation case. The outcome is only advisory, without necessarily killing a proposed activity, especially if there are broad social, economic and other benefits and potential adverse effects may be mitigated. Several states have stricter equivalents, like California's version which preceded **NEPA**, requires that a court may kill a project from going forward if the court decides the project would not be in the public interest. The California equivalent as an EIR for the expansion of an ongoing hazardous waste landfill which required a State permit under State law. Waste Management's consultant placed public notices, held public meeting for scoping, wrote the EIR and presented it to a public meeting. Unfortunately, hardly anyone in Kings County read the notices, participated in the scoping or any of the meetings! By chance a very famous lady environmental activist **Ellen Brockovich**, no doubt you loved the movie made about her with Julia Roberts (all true by the way), saw a meeting notice and joined with a famous environmental activist organization to sue the project proponent. They were, right! Although the federal and state laws require postings, notices, meetings, etc., *they don't specify the language*. Posting in English ONLY may not be effective to inform a community which largely isn't English-speaking. Most everyone in Kings were Spanish-only speakers, listening to Spanish language radio, watching Spanish-language TV, seeing Spanish-language movies and tapes (pre- videos, CDs, DVDs, downloads), and reading Spanish-language newspapers. The judge ruled against our client, the project proponent, and required recasting everything including the process in English. The proponent declined to pursue it as everyone in the county hated the project from then on. Oh, the judge coined a new phrase, **Environmental justice**.

California has a **citizens' initiative to allow petitioners** if qualified to place potential laws on the state ballot for approval. One year, three contradictory insurance laws were so placed, passed and required years on discussion to resolve. R-California governor Pete Wilson decided it was too expensive to continue to have the private sector print the many thousands of yearly, multi-pages "manifests" to track hazardous waste from cradle-to-grave as was required under D-President Jimmy Carter's **RCRA**. The manifests were to assure

that state and federal agencies would know who generated what wastes, where and when and how much, plus its transport, storage and disposal to licensed TSDs. Part of the concept was to make this process so painful and expensive to comply with that hazwaste generators would find substitute chemicals and processes to eliminate hazardous wastes with all their terrible public, worker and environmental adverse effects. So, Governor Wilson had the California Prison System print these manifests from an original form. The copies looked fine and cost much less than the private sector. It took several years before bureaucrats looked at the filed manifests in their agency files and discovered... they all had the same tracking number! California is still trying to track down several years of the origin, fate and transport of generated hazwaste.

For decades, **California** professions like barbers, taxi drivers, cosmetologists, environmental assessors, etc. were required to obtain state certifications and permits to practice their handiwork. The State also had a very active **LUST** program to investigate and cleanup underground fuel tank leaks, paid for by a State fund. When the tax base declined, R-California Governor Jerry Brown decided these licenses which were to protect public and worker health, and the environment, were no longer necessary. The State abandoned these licensing requirements as “redundant.”

There was a **RCRA** hazardous waste site adjacent to the **Houston Ship Channel** tunnel which was an active oil refinery. The State closed the Channel due to noxious TCE odors. By chance, environmental technicians saw a machine shop worker unlock a monitoring well and pour shop wastes down the well. The worker said the shop foreman’s policy was to routinely dispose of shop wastes down these holes as it was cheaper than disposal to **RCRA**-certified treatment, storage and disposal facilities which required a licensed hauler and facility and tons of paperwork. The refinery manager said Crown Central Refinery was having labor disputes.

The federal government granted “primacy” to states to run their **RCRA**-equivalent programs. The Sportsman Paradise of **Louisiana** obtains most of its State money from the oil, gas and chemical industries. The Louisiana Department of Environmental Quality accepted a Louisiana State University hydrology professor’s “letter of exemption” declaring there were no groundwater resources or aquifers to protect from hazardous wastes in the State so the facility need not comply with **RCRA** requirements of waste classification, groundwater monitoring and reporting hazardous contaminants in groundwater to the State because there was no groundwater in Louisiana. The State agency accepted this exemption letter for several years.

CITIES

When San Francisco dedicated its new **CWA**-compliant Oceanside **POTW**, its ceremony included a handout of several pages in the many locally spoken languages, including brail. D-U.S. Senator Diane Feinstein officiated at the ceremony. The plant which was built under a hill excavated below the SF Zoo on City-owned land to avoid complying with the **CEQA**. Construction was delayed while Kangaroo mommies came to term and delivered their babies. When Senator Feinstein was handed the large and bulky fact-sheet in all

these languages, she exclaimed, “My father always referred to San Francisco governance as the **Board of Stupidvisors!**”

The SF Hazardous Materials Advisory Committee learned aquatic life in San Francisco Bay was contaminated with several pollutants from gold and silver mining, manufacturing, military and agricultural activities. The Committee held hearings. Several health workers wanted a ban or some relief from eating Bay-fish. Although it could not establish a direct link from eating fish to disease and bad health, theoretic equations under *reasonable* assumptions and analytical laboratory tests using EPA protocols showed quite high projected incidents of human cancer and heavy metal poisoning. The City was asked to pay poor people cash to submit fish from the bay as a bounty to discourage fish-eating. Some thought it led to more fishing for the cash. Then some suggested the City provide canned fish from a certified source in exchange for Bay-caught fish. The City rejected this as too expensive. The Committee commissioned multi-lingual signs to be posted in all nine Bay-area counties, to say, “Women who are pregnant or nursing, or children under eight years old are warned not to eat more than one fish per week to protect their health from contaminants,” or something similar language. The signs were translated into Spanish, Mandarin, Tagalog, Vietnamese, Korean, etc. (Imagine how difficult it is to service the 911, poison and suicide hotlines in SF.) One of the multi-lingual HMAAC members came into one meeting hysterical over the Spanish translations. Catania Galvan said, it read, “**Women who are pregnant, and are nursing, and are under eight years old...**”

San Francisco citizens organized to draft an **Environmental Baseline Report** and then an **Environmental Action Plan**. They lobbied the Board of Supervisors to create an Environmental Department to promote environmentally sound management. To meet rising City water and wastewater capital and operation and maintenance costs, the City raised water and sewer rates very significantly each year. Even though the City provided rate subsidies to the poor, many poor people were too proud, uninformed or disinterested in applying for these generous subsidies. Many of the families installed their own shallow drinking water wells with well points and fitted them with air compressors as pumps to avoid paying the City’s water and sewer fees. This was illegal and unhealthy as the artificial fill materials in the shallow aquifer were mainly composed of old landfills, slaughter house wastes, commercial and industrial wastes, and oil spills. The several human health studies confirmed high levels of asthma, diabetes, hypertension and several forms of cancer in the neighborhood. Because there were high levels of smoking, alcoholism, red meat consumption, obesity, crime and social stress, drug use, incarceration, and amateur home repairs and gardening, as well as exposure to contaminated drinking water, the studies were unable to separate the causes. But it led to the City establishing several health clinics in the neighborhood.

PIMA COUNTY

The **CWA** upgraded its standards for effluent releases from Publicly Owned Treatment Works and required the States which ordered its municipalities to pay for these federally mandated, and often state enforced requirements. President Regan ended the federal funding to upgrade **POTWs**. The Arizona Department of Environmental Quality required **Pima County** to meet these standards. This is how Pima County had to take a loan of over \$200M, not including cost-overruns and debt service, to upgrade its regional wastewater

reclamation facilities or **POTWs** to meet the requirements that the effluent would not harm aquatic life in the receiving national waters of the U.S. Do you think there are such receiving waters in Pima? Nutrient removal is very costly, but there's a hidden benefit: our nutrient-free wastewater is a great fresh drinking water source recharging our aquifers. The upcoming Pima County sewer service rates are largely due to debt service on nutrient removal – nitrogen and phosphorus.

WATER DILEMMA

Life source	
Surface water (State resource)	Groundwater (Rule of capture through land ownership)

Water Forms

Molecular dihydrogen oxide	Liquid	Solid	Gas
Physical water		Paper water	

Water Rights

Private	Public	Federal	State/ Municipal	Tribal
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Water Owners

Prior riparian	Beneficial	Compact/ treaty	Adjudicated	Negotiated	Purchased
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Water Equity

At a UoA February 2017 Science Diplomacy and Policy conference, an eminent professor/ research fellow, Helen Ingram, at UoA's Southwest Research Center and professor emeritus at University of California, Irvine, argued that "**water efficiency and equity are not compatible**" and that scientists and engineers have some responsibility for "equity." She also said, "**Water flows uphill toward money.**" I don't know how, can or should do this, and certainly have no training in such. Another professor, Katherine Vammen, Deputy Director of the Nicaraguan Research Center for Aquatic Resources at the National Autonomous University of Nicaragua, noted: "**Higher incomes typically have two times the access to good drinking water and four times the access to sanitation.**"

See Reisner, 1993. *Cadillac Desert: The American West and Its Disappearing Water*; Glennon, 2011. *Water Follies: Groundwater Pumping and the Fate of America's Fresh Waters*; Siegel, 2015. *Let There Be Water: Israel's Solution for a Water-Starved World*; Singh, ed., 2017. *Handbook of Applied Hydrology: A Compendium of Water Resources Technology*, 2nd ed.

Do you think everyone should have access to a clean, healthy and safe environment? How?

